

The Muricidae of Fiji

(Mollusca : Gastropoda)

Part I Subfamilies Muricinae and Tritonaliinae

Plus an Addendum with Text figure 11

BY

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Vatukoula, Fiji Islands

(Plates 14, 15; 10 Text figures; 1 Map)

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THIS IS THE SEVENTH PART in the series of faunal monographs dealing with the marine mollusca of the Fiji Islands.

In accordance with past procedures only species collected by resident collectors and the author are listed as verified records. Fiji specimens preserved in Museums and private collections outside the Fiji Islands shall be

taken into consideration at a later stage, provided that collecting data are reliable.

Species recorded from Fiji have a wide-ranging distribution in the Indo-Pacific, living in an area extending from the Red Sea to the Tuamotu Archipelago. Members of the two subfamilies discussed below are confined within tropical to temperate waters between Latitudes 40° N to



40° S. The area between Southern Japan-Philippines-Northeast Australia (Longitude 120° E to 150° E) is the richest in muricine species. About 35 muricine species have been recorded from Japan and Australia, and there is an appreciable fall-off in the number of species living to the West and East of this central Indo-Pacific region: South Africa 7 species, East Africa 9 and Aden about 10 species. In the easterly direction the number of species declines to 16 in Fiji, 10 in the Society Islands-Tuamotu Archipelago region and less than half a dozen species in the Hawaiian Islands. Other groups of Mollusca, particularly tropical gastropod forms, attain their optimum distributional densities within this geographical area.

For notes on the geography of the Fiji Islands and other pertinent data see CERNOHORSKY (1964).

THE ANIMAL

The animal's foot is moderate in size but powerful, the mantle is thin and generally of the same colour as the foot. The siphon is simple, tentacles are moderately short and stubby, and simple eyes are positioned on the outside of the thickened base of the tentacles. Sexes are separate, and the penis which is situated behind the right tentacle is thickened at the base but slender, whip-like and curved at the distal end; the size of the male verge will vary from 14% to 20% of shell-length.

The proboscis is long and slender and the radular ribbon of specimens examined varied from 4 mm to 24 mm in length. The radula, which is of the rhachiglossate type, contains about 100 to 300 rows of teeth, each row consisting of a multicuspid rhachidian and simple unicuspid and curved laterals. The first dozen rows of teeth are greatly worn, and broken cusps may often persist for another dozen rows. In the subfamily Muricinae the rhachidian has either 3 larger main cusps and 2 intermediate denticles or 3 large cusps only. In the Tritonaliinae the rhachidian is equipped with 3 to 5 main cusps and with from 3 to 6 small, vertically incised secondary denticles.

The operculum is generally brown to yellowish-brown in colour, corneous, and attached to the foot by the scabrous part of the interior opercular lining, while a semicircle portion is smooth and glazed. The nucleus is either basal, latero-basal or off-central in Muricinae; in the Tritonaliinae the nucleus is mostly dextro-lateral or occasionally latero-basal. As pointed out by VOKES (1964) no great reliance can be placed on the opercular nucleus in the determination of a subfamilial position, since members of other muricid subfamilies possess both types of opercula.

Muricidae are active predators and borers; they do not confine their hole-drilling to any particular group of mol-

lusks but prey on almost all species of gastropods and pelecypods. The holes bored by muricids into the shells of other molluscs are perfectly circular on the outer rim, with the widest diameter at this part, and then slightly converge towards the interior of the shell. The break-through point is less perfect and somewhat irregular. Because of their geometrical outline, these muricid holes have on occasion been mistaken for man-made holes and classed as artifacts by archaeological excavators.

An accessory boring organ located near the anterior part of the foot has been reported by CARRIKER (1961) in some species of Muricidae. Although some writers have attributed a dissolving or softening effect to the secretion of the accessory salivary glands, the actual boring process appears to be mainly mechanical. The secretion of a proteolytic enzyme during boring in Muricidae (MAN-SOUR-BEK, 1934) undoubtedly would assist during the boring process as a lubricant and absorber of small fragments of calcium carbonate. GRAHAM (1941) reports the secretion of the accessory salivary gland of the muricid *Nucella lapillus* (LINNAEUS, 1758) to have a pH of 6, and to have no dissolving effect on calcium carbonate. A similar secretion was observed by the author in the cyp-raeid *Mauritiana eglantina* (DUCLOS, 1833), which is an algae- and deposit-feeder, and not a borer. The muricid species *Hexaplex pomum* (GMELIN, 1791) does not have accessory salivary glands (CARRIKER, 1961), and the boring process is therefore purely mechanical in this species. In view of the group's anatomical features and feeding habits, the Muricacea are regarded to be in a more primitive stage of development than the two other stenoglossan superfamilies Buccinacea and Volutacea (FRETTER & GRAHAM, 1962).

SHELL AND HABITAT

Species of the genus *Murex* s. str. are especially vulnerable to predators due to the moderate thickness of the shell and wide open aperture; the prominent sharp spines may have developed in this group as a compensatory defence feature. Species of the subgenus *Haustellum* SCHUMACHER, 1817, have retained the wide-open apertures, but the shell has become thicker and heavier and the spines have become degraded or obsolete. In *Chicoreus* MONTFORT, 1810 shells are rather solid and spines have changed into shorter fronds. In the large species of *Chicoreus* and *Phyllonotus* SWAINSON, 1833, the aperture is still wide open, but the shells are so large and solid that it would prove difficult for predators to dislodge the shell or gain access to the apertural opening when the animal is reposing on the substratum with the aperture downward. The smaller

species of *Chicoreus*, still retaining their solid shell, have a reduced apertural size which compensates for their smaller size and lighter weight. In the *Pterynotus-Nauctia* group species have lost the spines or fronds, but have become smaller and more slender in form, a distinct advantage in coral-reef environment, and their apertural opening is reduced. Living species of Muricinae show therefore a certain correlation of compensating characters of shell-weight and thickness, size, degree of prominence of spines and apertural size.

In Fiji specimens examined, the colour and size of the shell, apertural colouring, size and number of spines or fronds, sculpture, columellar denticulation were found to be subject to ecologic and individual variation; a similar degree of variation has been reported by WU (1965). The general form of the shell, number of varices, labial denticulation and length of siphonal canal were less prone to vary, and surprisingly consistent in many species.

Fijian Muricidae are always associated with coral reefs; the majority of species flourish in muddy-sand environment, while species like *Chicoreus ramosus* (LINNAEUS, 1758) favour a clean sand environment, and *Pterynotus triqueter* (BORN, 1778) occurs in both clean and muddy sand localities. Most species inhabit the intertidal zone while only a few species live in deeper water. Some intertidal species, e. g. *Chicoreus carneolus* (RÖDING, 1798) can exist under the most adverse conditions and even flourish. During heavy floods on the Island of Viti Levu, whole molluscan populations of coastal reefs were completely destroyed due to the inundation of fresh water in sheltered bays. *Chicoreus carneolus*, however, survived without any ill effects or reduction in numbers.

TAXONOMY

A recent account of the taxonomy of muricids and supra-specific arrangement of the subfamilies Muricinae and Tritonaliinae has been published by VOKES (1964), and no duplication is intended here. In Muricidae as in other groups of Mollusca, supraspecific taxonomy has received more attention than taxonomy on the specific level. The taxonomic works of RÖDING (1798) and LINK (1807), both binomial catalogues containing numerous generic and specific names, have been brought to the attention of malacologists early in this century. Yet in the last 50 years little attention has been directed to the elucidation of new taxa contained in these works. Efforts have been made, commendable ones, to be sure, to elucidate the true authorship of works published anonymously, while the

actual contents have largely remained ignored. Consequently many Lamarckian names adopted by subsequent writers continue to remain in use, names which should have been replaced by valid prior ones.

Valid but forgotten names which have been rushed into print before 1960 are taxonomically acceptable, while such names introduced into literature after 1960 qualify as *nomina oblita* (art. 23b, Code of ICZN, 1964). Many zoologists feel that insufficient time has been granted to the elucidation of names introduced in works which have come to the attention of workers in recent years. In view of the current dispute about art. 23b of the Code of IZCN (1964) *nomina oblita* which have been simply rejected by the International Commission on Zoological Nomenclature, must be suppressed under the plenary powers (in litt., Assist. ICZN, 10 October 1966). Matters are further complicated in so far that a name which has been used in primary literature on the subject in the last 50 years is taxonomically valid, whereas a name appearing in secondary literature is not. No definition on what constitutes primary or secondary zoological literature has been offered by the International Commission on Zoological Nomenclature, and the interpretation therefore rests with every individual worker.

The three RÖDING names re-introduced here into muricid literature may after all not qualify as *nomina oblita*, as they could have been mentioned in the literature on the subject in the last 50 years. In view of the taxonomic problems involved in this particular case, it was thought advisable to accept the prior names; in one instance the existing name is a possible homonym, while in another instance a later but equally new name would have to be substituted.

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NEOGASTROPODA

MURIGACEA

MURICIDAE

Muricinae

Murex LINNAEUS, 1758

Murex LINNAEUS, 1758, Syst. Nat., ed. 10, p. 746 – Type species by SD (GRAY, 1847) *Murex tribulus* LINNAEUS, 1758

Characters: Shell moderately light in weight, spire elevated, whorls convex; spines slender and pointed, somewhat curved, closed, alternating between short and long. Sculpture consists of 3 varices per whorl, plain or gemmate axial cords, axial riblets in interstices and axial ribs on earlier whorls. Aperture wide and open, roundly ovate, columella smooth, edge of labial lip bluntly denticulate; siphonal canal generally slender and long, spinose, and with a narrow central slit on the ventral side. Operculum with a basal or sinistro-lateral nucleus. Rhachidians of radula with 3 large main cusps and 2 smaller intermediate denticles, laterals simple and unicuspid.

Discussion: VOKES (1964) in her revision of the group cited *Murex tribulus* LINNAEUS as the type species of *Murex* s. str. by subsequent designation of MONTFORT (1810) as *Murex pecten* MONTFORT. MONTFORT (*op. cit.*, p. 619) did not cite *M. tribulus* LINNAEUS but rather *M. pecten* as the type of *Murex*, and his illustration on the opposite page as well as his figure references represent *Aranea triremis* PERRY, 1811 (= *Murex pecten* LIGHTFOOT, 1786), a similar but distinct species. MONTFORT's type designation is invalid, since his *M. pecten* is not synonymous with *M. tribulus* LINNAEUS, nor was *M. pecten* one of the originally included nominal species (art. 69(a) (i), Code of ICZN, 1964).

Murex pecten MONTFORT, 1810, although an earlier name for the species *M. triremis* (PERRY, 1811), is a primary homonym of *M. tribulus* var. *pecten* LIGHTFOOT, 1786 (p. 188, no. 4001 – based on RUMPHIUS [1705], t. 26, fig. 3). The cited figure is the "Dubbelde Spinnkop" of RUMPHIUS, and is the same species as *M. triremis* (PERRY) and *M. tenuispina* LAMARCK, 1822. *Murex pecten* LIGHTFOOT, 1786, should therefore replace PERRY's later *M. triremis*.

(*Murex* s. str.)

Murex trapa RÖDING, 1798

(Plate 14, Figure 1)

1798. *Murex trapa* RÖDING, Mus. Bolten., p. 145, no. 1817 (ref. MARTINI, 1777, 3, t. 113, figs. 1055, 1056)

1822. *Murex rarisipina* LAMARCK, Hist. nat. anim. sans vert., 7: ref. MARTINI, *op. cit.*, fig. 1056)

1845. *Murex martinianus* REEVE, Conch. Icon., 3, pl. 18, sp. 72 (ref. MARTINI, *op. cit.*, fig. 1056) [non PFEIFFER, 1840]

1965. *Murex trapa* RÖDING, SHI-KUEI WU, Bull. Inst. Zool. Acad. Sinica 4: 98, fig. 13 (radula)

Shell: Shell light in weight, base colour creamy-white, spiral cords on body whorl white or creamy-white, interstices rusty-brown. Teleoconch with 7 whorls, protoconch with 1½ - 2 smooth brown nuclear whorls. Sculptured with smooth or gemmate spiral cords, 3 varices at every whorl and close-set axial riblets in interstices. Spines moderately long, sharp, closed and somewhat recurved; primary spines number from 3 - 6 on the labial varix and from 4 - 5 on the siphonal canal. Aperture wide and oval, labial lip with 11 - 16 denticles, columella white and smooth, deep interior of aperture brown. Siphonal canal long, slender and spinose, slit on ventral side open. Operculum with a basal nucleus.

Size: 60 mm to 110 mm.

Type locality: None. The specimens illustrated by MARTINI (1777) were reported from Amboina and Tranquebar. "Amboina, Indonesia" is designated as type locality.

Habitat: In muddy sand, in shallow water. Not uncommon in Southeast Viti Levu (Lodoni jetty), but rare elsewhere. **Distribution:** North and South Viti Levu. – From Indonesia to Japan, East Australia and the Fiji Islands.

Discussion: The species is similar to *Murex tribulus* LINNAEUS, but differs in characters of creamy-white spines and spiral cords, brown interstices, somewhat fewer and shorter spines, coarser sculpture on the penultimate and earlier whorls, and an irregular siphonal canal.

Murex tribulus LINNAEUS, 1758

(Plate 14, Figure 2)

1758. *Murex tribulus* LINNAEUS (pars), Syst. Nat., ed. 10, p. 746, no. 444 (first ref. COLUMNA, 1616, t. 60, fig. 6)

1817. *Murex scolopax* DILLWYN, Descr. cat. rec. shells 2: 681 (ref. MARTINI, 1777, 3: t. 113, fig. 1052 and CHEMNITZ, 1795, 11, t. 189, figs. 1819, 1820)

1822. *Murex ternispina* LAMARCK, Hist. nat. anim. sans vert. 7: 158 (no figures cited)

1822. *Murex crassispira* LAMARCK, Hist. nat. anim. sans vert. 7: 157 (MARTINI, *op. cit.*, t. 113, figs. 1052-1054 and CHEMNITZ, *op. cit.*, t. 189, figs. 1819, 1820)

1845: *Murex nigrispinosus* REEVE, Conch. Icon., 3, pl. 20, sp. 79

1913: *Murex (Tribulus) ternispina* LAMARCK, SCHEPMAN, Sib. Exped. 49 d: 341

1913. ? *Murex (Tribulus) ternispina* var. *rufolirata* SCHEPMAN, Siboga Exped. 49 d: 342

1957. *Murex crassispira* [sic] LAMARCK, DODGE, Bull. Amer. Mus. Nat. Hist. 113 (2): 82-83

Shell: Uniformly creamy-white to brown in colour. Teleoconch with 7 - 8 whorls, protoconch with 2 smooth, glassy-brown nuclear whorls. Sculptured with clathrate spiral

cords, 3 varices per whorl, and close-set and gemmate axial ridges in interstices. Spines long, sharp, closed and recurved; primary spines number from 6 - 8 on the labial varix and from 4 - 6 on the siphonal canal. Aperture wide and oval, labial lip with 10 - 15 denticles, some of which are paired; columella white and smooth, anal notch obsolete, deep interior of aperture brown. Siphonal canal long, slender, straight and spinose. Operculum with a basal nucleus.

Size: 70 mm to 120 mm.

Type locality: O. Asiae. (Java, Indonesia).

Habitat: in clean and muddy sand and coral rubble substratum, from 1 - 7 fathoms. Moderately common.

Distribution: Throughout the Fiji Islands. - From the Red Sea and the Gulf of Oman to Japan, East Australia and the Fiji Islands.

Discussion: From the 7 figures cited by LINNAEUS (1758), 4 figures depict *Murex tribulus* auctt., and 3 figures represent *M. pecten* LIGHTFOOT. LAMARCK (1822) cited MARTINI's figures 1052 - 1054 for his *M. crassispina*. These figures represent *M. tribulus* and were cited for this species by both RÖDING (1798) and LINK (1807); figure 1052 was cited by DILLWYN (1817) for *M. scolopax*.

Murex nigrispinosus REEVE, a variant of *M. tribulus* with black-tipped spines, appears to be restricted to the Western Pacific and does not occur in Fiji. Neither does *M. pecten* LIGHTFOOT, which differs from *M. tribulus* in having more numerous and geometrically arranged spines; the spines on the siphonal canal are wider apart in *M. tribulus*, having a spacing of ca. 4.5 mm to 6.5 mm, whereas in *M. pecten* the width between the spines is only 3 mm to 4 mm.

The length of spines in *Murex tribulus* is variable: the longest spine, which is generally situated on the dorsal varix on the body whorl, measured from 12 mm to 50 mm in specimens examined.

(*Haustellum*) SCHUMACHER, 1817

Haustellum SCHUMACHER, 1817, Essai Nouv. Syst., p. 213 - Type species by *Murex haustellum* LINNAEUS, 1758

Characters: Shell solid and globular, spire elevated, whorls convex and with a presutural keel, spines absent or few and thornlike. Whorls number 8, varices 3, early whorls sculptured with axial riblets and spiral striae, later whorls striate and nodulose. Aperture wide and oval, elevated, labial lip obsoletely denticulate, labrum plicate, columella smooth or plicate, anal notch prominent and formed like an inverted Ω . Siphonal canal slender and long, slit on ventral surface open. Operculum with an off-central nucleus.

Murex (Haustellum) haustellum LINNAEUS, 1758
(Plate 14, Figure 3)

1758. *Murex haustellum* LINNAEUS, Syst. Nat., ed. 10, p. 746, no. 443 (first ref. BUONANNI, 1684, 3, t. 268)
1798. ? *Murex scolopaceus* RÖDING, Mus. Bolten., p. 144, no. 1813 (ref. FAVANNE, 1780, t. 38, fig. B2)
1811. *Aranea denudata* PERRY, Conchology, pl. 45, fig. 1 (non *Triplex denudata* PERRY, 1811, pl. 7 = *Chicoreus* sp.)
1817. *Haustellum laeve* SCHUMACHER, Essai Nouv. Syst., p. 213
1840. *Murex erythrostoma* SWAINSON, Treat. Malac., p. 296 (non *M. erythrostomus* SWAINSON, 1831)
1891. *Murex haustellum* var. *longicaudus* BAKER, Proc. Acad. Nat. Sci. Philadelphia, p. 56 (non WOOD, 1828)
1964. *Murex (Haustellum) kurodai* SHIKAMA, Venus: Japan. Journ. Malac., 23 (1): 35, pl. 3, figs. 1, 2

Shell: Shell solid and globular, creamy-white to fawn in colour, variously maculated with brown. Teleoconch of 8 convex whorls, protoconch missing in specimens examined. Early whorls sculptured with axial ribs and spiral striae, later whorls nodulose, nodules most prominent on presutural keel; varices prominent, numbering 3 per whorl, spines absent or few and thorn-like. Aperture wide and oval, elevated, labial lip with small denticles, labrum with short plicae. Columella creamy-white to orange, smooth or plicate; interior of aperture white, anal notch distinct and moderately deep. Siphonal canal long, thickened at base but tapering to distal end, slit on ventral surface narrow.

Size: 80 mm to 125 mm.

Type locality: O. Asiae.

Habitat: On sand and coral-rubble substratum, in 2 to 3 fathoms. Rare.

Distribution: North and South Viti Levu and Yasawa group. - From the Red Sea to Japan, East Australia and the Fiji Islands.

Chicoreus MONTFORT, 1810

Chicoreus MONTFORT, 1810, Conchyl. Syst., 2: 611 - Type species by *OD Murex ramosus* LINNAEUS, 1758

Characters: Shell heavy and solid, spire elevated, whorls convex; spines frondose and prominent, closed or open, sometimes recurved. Sculptured with spiral striae, axial riblets and nodules. 3 varices per whorl and nodes between varices. Aperture wide and oval in the type-species, but less large in smaller species. Labial lip dentate, columella smooth or occasionally denticulate, calloused, anal notch prominent. Siphonal canal broad, only moderately long, slit on ventral surface open.

Operculum with a sub-basal or basal nucleus. Radula similar to that of *Murex* s. str. but the base of the rhachidians is generally less broad and somewhat higher than in

Murex; the central main cusp is longer than the flanking main cusps, the 2 intermediate denticles are either moderately large or small.

Discussion: For remarks on the type-species see under *Chicoreus ramosus* (LINNAEUS).

Chicoreus aculeatus (LAMARCK, 1822)

(Plate 14, Figure 5; Text figure 1)

1822. *Murex aculeatus* LAMARCK, Hist. Nat. anim. sans vert., 7: 163 (no figures cited; non *Aranca aculeata* PERRY, 1811 = *Murex* s. str.)

Shell: Shell light in weight, reddish-brown in colour, varices and siphonal canal occasionally tinged with lavender. Teleoconch of 6 to 7 whorls, protoconch with $1\frac{1}{2}$ to 2 smooth and mammillate nuclear whorls. Sculptured with strong and weak finely beaded spiral ridges, 3 varices per whorl and nodes between varices. The frondose spines are very short or obsolete on the first three mature whorls, but moderately produced on later whorls; the spines number from 5 to 8 on the labial varix and from 2 to 4 on the siphonal canal. Aperture small and oviform, rose-violet or lavender in colour, deep interior bluish; labial lip with 10 to 15 denticles, columella smooth, anal notch distinct. Siphonal canal irregular and moderately produced, recurved, slit on ventral side open.

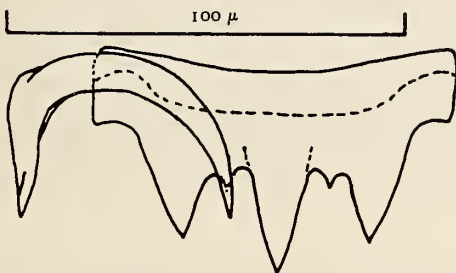


Figure 1

Half-Row of Radular Teeth of *Chicoreus aculeatus* (LAMARCK)
Fiji Islands

Radula: The radula is of the *Chicoreus* type, with 3 main cusps and 2 intermediate denticles on the rhachidian; rhachidians are light brown in colour, laterals translucent white. Length of ribbon 4.6mm, width 0.14 millimeters in a shell 25.0mm in length; 164 rows of teeth (+ 26 nascentes) were counted in this example (Text figure 1).

Size: 22 mm to 38 mm.

Type locality: None. ("L'Océan Indien," KIENER, 1843).

Habitat: On sand and coral-rubble substratum in 10 to 15 fathoms. Rare.

Distribution: Mamanuca group, Fiji Islands. – From the Philippines to Japan and the Fiji Islands.

Discussion: *Murex aculeatus* LAMARCK is not a secondary homonym of *Aranca aculeata* PERRY, 1811 (pl. 46, fig. 2) which is a *Bolinus* species of the genus *Murex* s. str.

Chicoreus brunneus (LINK, 1807)

(Plate 41, Figure 6; Text figure 2)

1807. *Purpura brunnea* LINK (pars), Besch. Nat.-Samml. Univ. Rost., 3te Abth., p. 121 (ref. MARTINI, 3, t. 105, figs. 990, 991 only)

1811. *Triplex rubicunda* PERRY, Conchology, pl. 6, fig. 4 (non *Purpura rubicunda* RÖDING, 1798; nec *Murex rubicunda* PERRY, 1811, pl. 54)

1822. *Murex adustus* LAMARCK, Hist. nat. anim. sans vert., 7: 161 (ref. MARTINI, *op. cit.*, figs. 990, 991)

1854. *Murex despectus* A. ADAMS, Proc. Zool. Soc. London for 1853: 71

Shell: Shell solid and heavy, generally blackish-brown in colour, blackish cords appearing on a lighter background; spire elevated, whorls convex. Teleoconch consisting of 6 whorls, protoconch of 2 nuclear whorls which are calcified in adult specimens; juvenile shells have a protoconch of 2 smooth, light-brown nuclear whorls. Sculptured with strong spiral cords and intermediate spiral ridges, 3 varices per whorl (4 on early whorls) and a prominent node

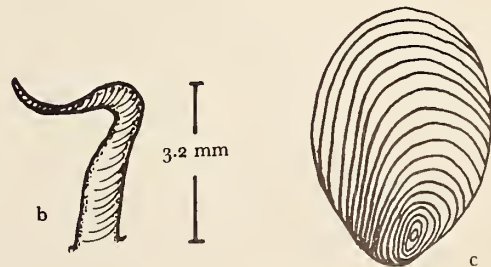
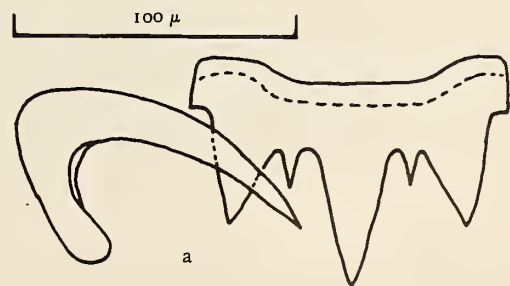


Figure 2

Chicoreus brunneus (LINK)
a. Half-Row of Radular Teeth b. Penis c. Operculum
Fiji Islands

between varices. The frondose spines are thick, heavily foliated and close-set, central labial fronds generally recurved. Aperture moderate in size, roundly oviform, rosyrred at edges, deep interior white; labial lip elevated, ornamented with 13 to 23 irregular denticles, columella smooth, anal notch distinct. Siphonal canal broad and short, slit on ventral side open.

Radula: The radula (Text figure 2) is of the *Chicoreus* type with 3 main cusps and 2 intermediate denticles on rhachidian. The radular ribbon is 7.1 mm long and 0.24 millimeters wide in a shell 42.0 mm in length; the first dozen rows of teeth are badly worn, cusps on rhachidians worn down to the base. Fully-formed rows of teeth number 187 (+ 26 nascentes). Operculum with a basal nucleus.

Size: 25 mm to 85 mm.

Type locality: None. MARTINI (1777) mentioned Banda, Amboina and Taekang Besi as localities for the species. "Banda Island, Indonesia" is designated as type locality.

Habitat: Under coral rocks, on clean sand or coral substratum, in shallow water. Moderately common.

Distribution: Throughout the Fiji Islands. - From East Africa to Japan, Australia and Samoa.

Discussion: LINK's *Purpura brunnea* is a composite species, based on MARTINI's figures 990, 991, 993, and 994. The first 2 figures represent *P. brunnea* LINK which is the *Murex adustus* of LAMARCK and authors. The latter 2 figures, however, depict *M. capucinus* RÖDING and LAMARCK. TOMLIN & WINCKWORTH (1936) arrived at the same conclusion in their analysis of LINK's species. The type figures are therefore here restricted to MARTINI, 1777, 3, t. 105, figs. 990 and 991.

COTTON (1956) included the Queensland species *Murex australiensis* A. ADAMS, 1853 and the New Caledonian *M. huttoniae* WRIGHT, 1878 in the synonymy of *M. adustus* LAMARCK. E. A. SMITH (1897) compared the holotype of *M. penchinati* CROSSE, 1861 in the British Museum (Natural History) with New Caledonian specimens of *M. huttoniae* WRIGHT, and found them to be identical in every respect.

Chicoreus capucinus (RÖDING, 1798)

(Plate 14, Figure 7)

1791. *Murex ramosus* var. γ GMELIN (pars), Syst. Nat., ed. 13, p. 3528, no. 13 (non LINNAEUS, 1758)
 1798. *Purpura capucina* RÖDING, Mus. Bolten., p. 143, no. 1797 (ref. Tour d'Auverg., [FAYANNE, 1784], 1073, and MARTINI, 1777, 3, t. 105, fig. 994)
 1807. *Purpura brunnea* LINK (pars), Besch. Nat.-Samml. Univ. Rost., p. 121 (ref. MARTINI, *op. cit.*, figs. 993, 994 only)
 1822. *Murex capucinus* LAMARCK, Hist. nat. anim. sans vert. 7: 164 (ref. CHEMNITZ, 1795, 11, t. 192, figs. 1849, 1850 - spec. juv., fide LAMARCK)
 1914. *Murex permaestus* HEDLEY, Proc. Linn. Soc. New Str. Wales, 39: 745 (nom. nov. pro *M. capucinus* auctt.)

Shell: Shell heavy and solid, uniformly blackish-brown in colour, whorls convex. Teleoconch consists of 6 whorls, protoconch of $1\frac{1}{2}$ nuclear whorls. Sculptured with prominent spiral cords, intermediate lirac, axial riblets and striae; 3 varices per whorl and 2 axial nodes between varices; varices bluntly foliated. Aperture oviform, tinged with brown, labial lip with 14 to 17 prominent denticles; columella smooth, anal notch distinct. Siphonal canal broad, moderately short and slightly recurved, slit on ventral side open. Operculum with a basal nucleus.

Size: 45 mm to 60 mm.

Type locality: None. ("East Indies" fide MARTINI, 1777).

Habitat: Under coral rocks on muddy sand substratum, in shallow water. Rare.

Distribution: North Viti Levu. - From the Philippine Islands to North Australia and the Fiji Islands.

Discussion: The MARTINI (1777) figures 993 and 994 represent dorsal views of a dark brown shell resembling *Murex capucinus* of authors. The figured specimens were said to come from the East Indies and MARTINI further remarks that the specimen depicted in fig. 994 has slightly more frondose varices than the specimen illustrated in fig. 993. PFEIFFER (1840) assigns the figured species to *M. capucinus* LAMARCK. RÖDING (1798) clearly separated the frondose species of *Chicoreus* by placing them in the section "*Frondosae - Acstige*" while species of *Naquetia*

Explanation of Plate 14

- Figure 1: *Murex trapa* RÖDING. x 0.8
 Figure 2: *Murex tribulus* LINNAEUS. x 0.7
 Figure 3: *Murex (Haustellum) haustellum* LINNAEUS. x 0.6
 Figure 4: *Phyllocoma convolutum* (BRODERIP). x 2.6
 Figure 5: *Chicoreus aculeatus* (LAMARCK). x 1.4
 Figure 6: *Chicoreus brunneus* (LINK). x 0.6
 Figure 11: *Chicoreus ramosus* (LINNAEUS). x 0.2

- Figure 7: *Chicoreus capucinus* (RÖDING). x 0.6
 Figure 8: *Chicoreus carneolus* (RÖDING). x 0.6
 Figure 9: *Chicoreus laciniatus* (SOWERBY). x 1.3
 Figure 9a: *Chicoreus laciniatus* (SOWERBY). x 1.3
 Figure 9b: *Chicoreus laciniatus* (SOWERBY). x 1.3
 Figure 10: *Chicoreus microphyllus* (LAMARCK). x 1.4 & 1.2

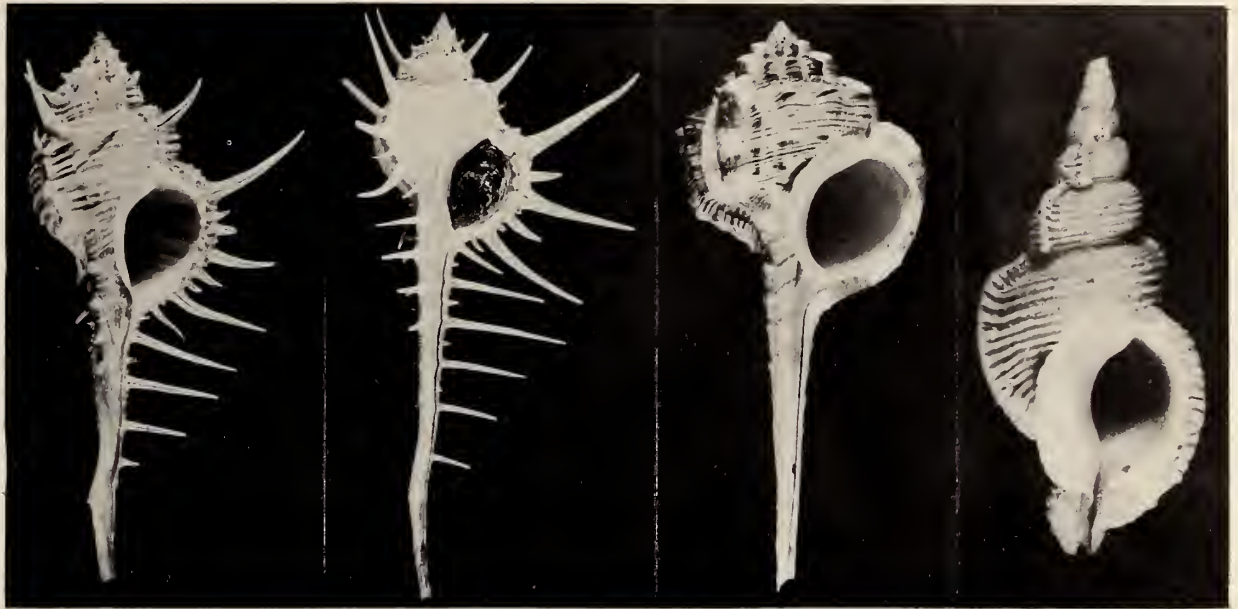


Figure 1

Figure 2

Figure 3

Figure 4

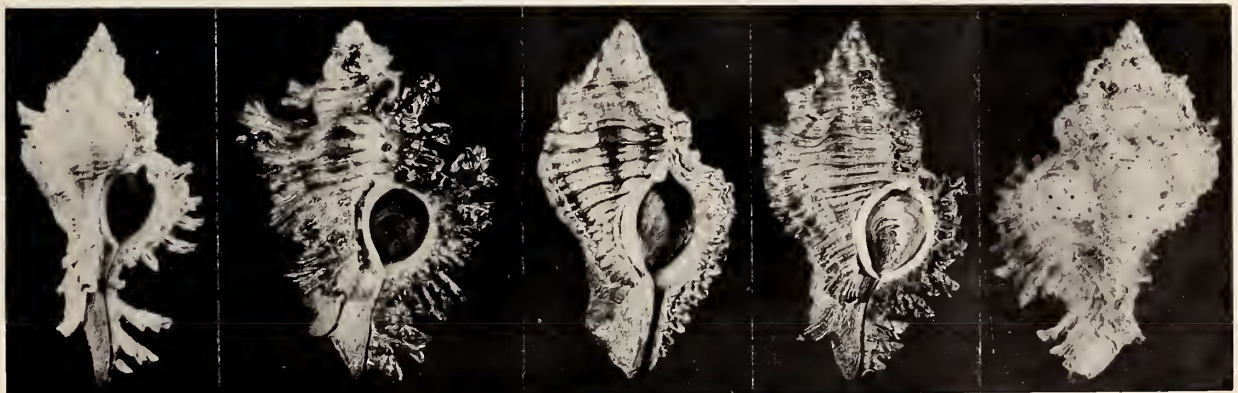


Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

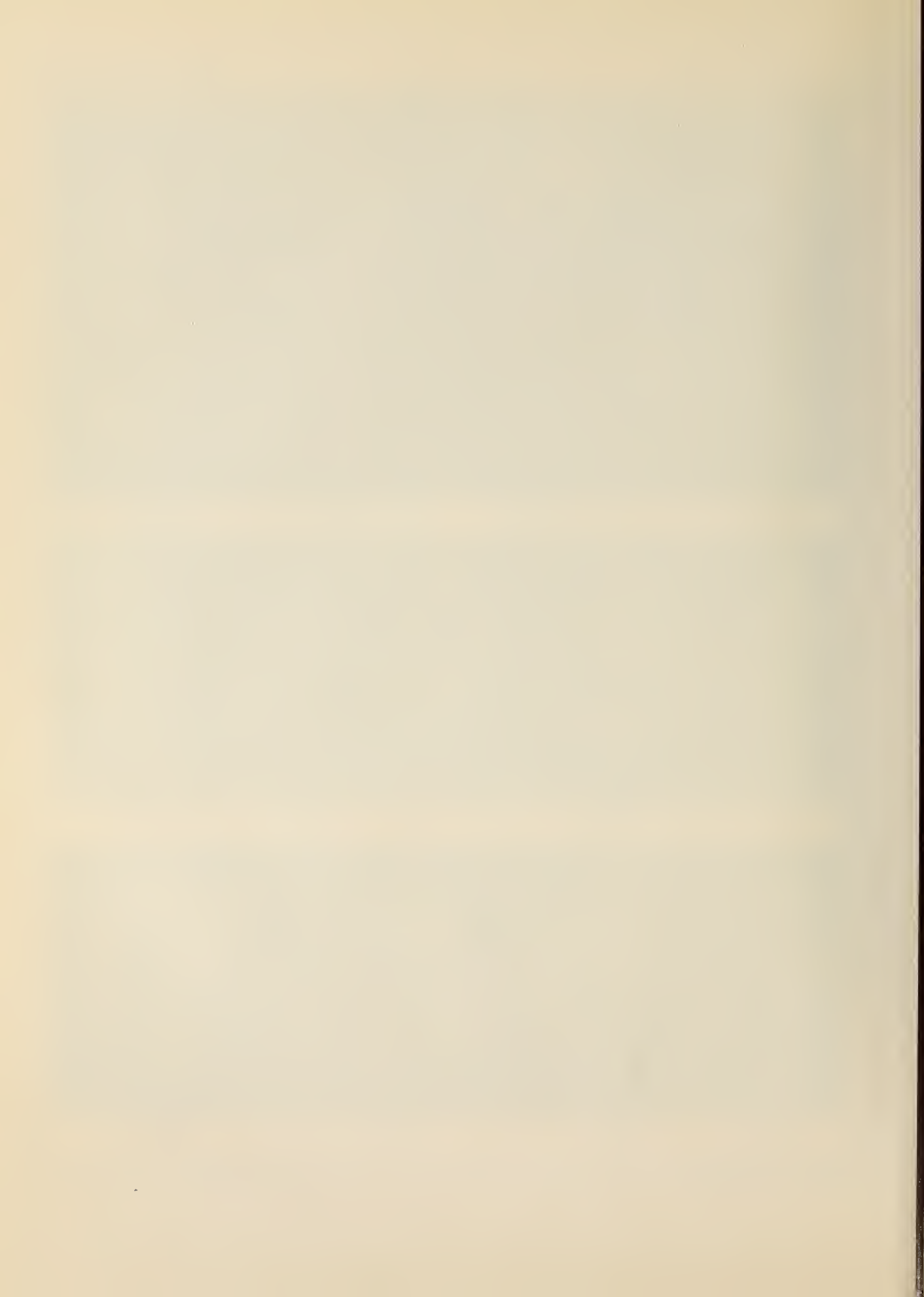


Figure 9 a

Figure 9 b

Figure 10

Figure 11



including *Purpura capucina* were placed under "Optusae – Abgestumpfte." RÖDING (*op. cit.*) appended a rather important diagnostic sentence after *P. capucina* "Kettenhörner mit stumpfen Nahten," a feature which identifies *P. capucina* in conjunction with the cited figures and MARTINI's text.

Recent writers assign *Murex capucinus* to *Naquetia* JOUSSEAUME, 1880, in the genus *Pterynotus* SWAINSON. H. & A. ADAMS (1853) placed the species in *Chicoreus* MONTFORT, and this placing appears to be quite appropriate. The general features of the shell of the species resemble *Chicoreus* more than *Naquetia* or *Pterynotus*; varices are neither wing-like nor compressed, and blunt varices are evident in other *Chicoreus* species; the anal notch is distinct in *Chicoreus* but shallow or obsolete in *Pterynotus* or *Naquetia*.

Chicoreus carneolus (RÖDING, 1798)

(Plate 14, Figure 8)

1791. *Murex ramosus* GMELIN (pars), Syst. Nat., ed. 13, p. 3528, no. 13 (non LINNAEUS, 1758)
 1798. *Purpura carneola* RÖDING, Mus. Bolten., p. 142, no. 1792 (ref. MARTINI, 1777, 3, t. 106, figs. 995, 996)
 1807. *Purpura elongata* LINK, Beschr. Nat.-Samml. Univ. Rost., p. 121 (ref. MARTINI, *op. cit.*, figs. 995, 996, 997) [non *Murex elongatus* LIGHTFOOT, 1786 = *Pterynotus* sp.]
 1811. *Triplex abortiva* PERRY, Conchology, pl. 6, fig. 5
 1841. *Murex torrefactus* SOWERBY, Conch. Illust., *Murex*, figs. 110, 111
 1841. *Murex torrefactus* SOWERBY, Proc. Zool Soc. London for 1840; pt. 8: 141
 1966. *Murex (Chicoreus) torrefactus* SOWERBY, CERNOHORSKY, The Veliger 8 (4): 231-233, 6 text figs. (radula and egg-capsules)

Shell: Shell solid and heavy, more slender than that of *Chicoreus brunneus* (LINK), uniformly dark brown in colour, spire elevated, whorls convex. Teleoconch of 7 whorls, protoconch with 2 orange-brown, smooth and bulbous nuclear whorls which are calcified in large specimens. Sculptured with gemmate spiral cords and close-set intermediate spiral ridges, 3 varices per whorl, and 1 to 2 nodes between varices. The frondose spines are moderately short on early whorls, but prominent on the labial varix and siphonal canal; this feature, however, is variable, and in some specimens the varical fronds are quite short. The labial varix has generally 5 primary and 5 secondary fronds, and the siphonal canal 3 frondose spines on the average. Aperture oviform, cream, orange or bluish-white in colour, deep interior white. Labial lip with 10 to 15 sharp denticles, columella smooth or occasionally with 1 to 3 denticles, anal notch distinct. Siphonal canal moderately produced, broad, slightly recurved, slit on ventral side open.

Size: 25 mm to 85 mm.

Type locality: None. The species has been reported from "Ostindien" by MARTINI (1777), and "Indonesia" is here designated as type locality.

Habitat: Under coral, on muddy sand substratum in shallow water. Common.

Distribution: Throughout the Fiji Islands. – From East Africa to Japan, East Australia and the Tuamotu Archipelago.

Discussion: The MARTINI figure 995 cited by RÖDING (1798) depicts the species *Murex torrefactus* SOWERBY and of authors. Figure 996 on the same plate is an immature specimen of the same species. The additional figure 997 cited by LINK (1807) is a white *Chicoreus* species with yellowish varices and is undeterminable.

It is unfortunate that an older and prior name has to be re-introduced into the literature in replacement for *Murex torrefactus* SOWERBY. Although both *Purpura carneola* RÖDING and *Triplex abortiva* PERRY could qualify as *nomina oblita* under the 50-year rule of the Code of ICZN (1964, art. 23b), *Purpura elongata* LINK does not. TOMLIN & WINCKWORTH (1936) drew attention to LINK's *P. elongata* which they rightly synonymized with *Murex torrefactus* SOWERBY. Even though *P. elongata* LINK is neither a primary nor a secondary homonym of *Murex elongatus* LIGHTFOOT (one is a *Chicoreus* species, the other a *Pterynotus* species), secondary homonymy could be introduced by writers assigning both species to *Murex* s. lat. In this particular case I thought it advisable to re-introduce RÖDING's prior name.

Chicoreus laciniatus (SOWERBY, 1841)

(Plate 14, Figures 9, 9a, 9b; Text figure 3)

1841. *Murex laciniatus* SOWERBY, Conch. Illust., *Murex*, fig. 59 (non DESHAYES & MILNE-EDWARDS, 1843)
 1960. *Murex (Chicoreus) raciniatus* (sic) SOWERBY, AZUMA, Cat. Moll. Okin. Japan., p. 33, pl. 4, fig. 10

Shell: Shell moderately solid, orange-brown to greyish-brown in colour, spire elevated, whorls convex. Teleoconch of 6 to 7 whorls, protoconch of 1½ smooth nuclear whorls which are generally calcified in mature specimens. Sculptured with strong spiral cords, 3 varices per whorl, 2 nodes between varices and axial ribs on earlier whorls. The frondose spines are short or very short, numbering from 7 to 9 on the labial varix and 2 to 3 on the siphonal canal. Aperture moderately large, oviform, mauve in colour; labial lip with 12 to 17 denticles, columella smooth, anal notch moderately distinct. Siphonal canal moderately short and broad, slit on ventral side open. Operculum with a basal nucleus.

Radula: The radula (Text figure 3) is of the *Chicoreus* type, rachiadians with 3 main cusps and 2 only slightly

smaller intermediate cusps. The radular ribbon is 4.6 mm long and 0.22 mm wide in a shell 39 mm in length. The ribbon is translucent white and contains 182 rows of teeth (+ 7 nascentes).

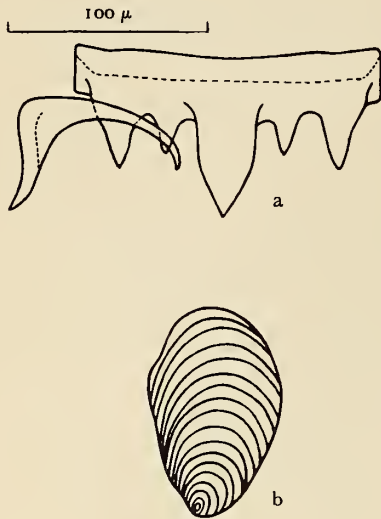


Figure 3

Chicoreus laciniatus (SOWERBY)

a. Half-Row of Radular Teeth

Fiji Islands

b. Operculum

Size: 32 mm to 45 mm.

Type locality: None. ("Les côtes de l'isle Aroë, mers du Japon," *vide* KIENER, 1843).

Habitat: Under coral, on sand and coral-rubble substratum from 0 to 5 fathoms. Rare.

Distribution: Mamanuca group, West off Viti Levu. - Philippine Islands, Japan.

Discussion: Fiji specimens have always a rose-purple or mauve coloured aperture, and conform in this feature with SOWERBY's illustration. Japanese specimens of *Murex laciniatus*, as figured by AZUMA (1960), HABE (1961) and D'ATTILIO (1966) show the aperture to be either white or cream.

The varical fronds are short or even blunt in this species, a feature which may prompted some writers to assign this species to *Naquetia* JOUSSEAUME. The species *Chicoreus microphyllus* (LAMARCK) has also degenerate fronds or spines, as do some specimens of *C. carneolus* (RÖDING); it would appear that the length of fronds or spines is a rather variable feature and an unreliable character for generic assignment.

Chicoreus microphyllus (LAMARCK, 1816)

(Plate 14, Figure 10; Text figure 4)

1816. *Murex microphyllus* LAMARCK, Tabl. Encycl. Méth., p. 4, pl. 415, fig. 5

1833. ? *Murex rubescens* BRODERIP, Proc. Zool. Soc. London for 1832, pt. 1: 174

1881. *Chicoreus poirieri* JOUSSEAUME, Le Naturaliste, 2 (42): 349 (New Caledonia)

Shell: Shell moderately solid, white to cream in colour, ornamented with blackish-brown cords and patches on varices. Teleoconch of 7 whorls, protoconch with 1½ smooth nuclear whorls. Sculptured with strong spiral cords, fine intermediate spiral lirae and 3 varices per whorl; varical fronds degenerate, appearing as short foliations, numbering from 5 to 7 on the labial varix and from 2 to 3 on the siphonal canal. Aperture moderately small, cream in colour, labial lip with 10 to 15 denticles, columella with 13 to 15 small denticles, anal notch prominent. Siphonal canal moderately slender, slit on ventral side open. Operculum (Text figure 4) orange-brown and with a basal nucleus.



Figure 4

Operculum of *Chicoreus microphyllus* (LAMARCK)

Size: 30 mm to 43 mm.

Type locality: None. ("Tahiti," *vide* BRODERIP, 1833).

Habitat: Under coral rock, on clean sand substratum, from 0 to 3 fathoms. Rare.

Distribution: North Viti Levu. - From the Seychelles Islands to Japan, East Australia and the Society Islands.

Discussion: *Chicoreus microphyllus* differs from other members of the genus in features of blunt varices and denticulate columella. These two characters seem to be rather variable and appear in species of the genera *Chicoreus*, *Pterynotus* and *Haustellum*.

Chicoreus ramosus (LINNAEUS, 1758)

(Plate 14, Figure 11; Text figure 5)

1758. *Murex ramosus* LINNAEUS (pars), Syst. Nat., ed. 10, p. 747, no. 488 (RUMPHIUS, 1705, t. 26, fig. A - first correct ref.)

1798. *Purpura ramosa* var. α RÖDING, Mus. Bolten., p. 142, no. 1786 (ref. MARTINI, 1777, 3, t. 103, figs. 981, 982)
 1798. *Purpura incarnata* RÖDING, Mus. Bolten., p. 142, no. 1791 (ref. MARTINI, *op. cit.*, t. 102, figs. 980 & t. 103, fig. 981)
 1822. *Murex inflatus* LAMARCK, Hist. nat. anim. sans vert., 7: 160 (ref. MARTINI, *op. cit.*, figs. 980, 981)
 1825. *Murex monodon* (pars) SOWERBY, Cat. shells coll. Tank., App. p. 19 (ref. MARTINI, *op. cit.*, fig. 980 only)
 1852. *Murex frondosus* MÖRCH, Cat. conch. Yoldi, 1: 97 (non *Triplex frondosus* PERRY, 1811 = *Chicoreus* sp.)

Shell: Shell large and solid, white or creamy-white in colour, ornamented with brown spiral lines and occasional brown patches near sutures. Teleoconch consists of 6 to 7 whorls, protoconch generally calcified. Sculptured with a few strong spiral cords, numerous fine spiral lirae and 1 to 2 nodes between varices; varices number 3 per whorl or 4 varices on earlier whorls. Varical fronds moderately produced, foliated, open and recurved; labial varix with 6 to 10 fronds, siphonal canal with 2 to 3. Aperture large,

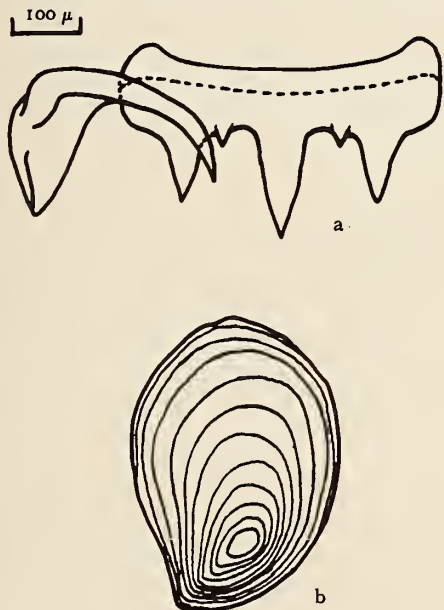


Figure 5

Chicoreus ramosus (LINNAEUS)

a. Half-Row of Radular Teeth

Fiji Islands

b. Operculum

roundly ovate, rosy-red on periphery, white in interior. Labial lip with 11 to 17 denticles, fifth denticle anteriorly of the siphonal canal larger than others; columella smooth, anal notch prominent. Siphonal canal broad and recurved, slit on ventral side open. Operculum with sub-basal nucleus.

Radula: Radular ribbon (Text figure 5) is 24.0 mm long and 0.80 mm wide in an animal with a shell 216 mm in length. The ribbon contains 215 rows of teeth (+ 13 nascentes); rhachidians equipped with 3 main cusps and 2 rather small intermediate denticles.

Size: 100 mm to 230 mm.

Type locality: In Sinu Persico, Jamaica; (latter locality erroneous).

Habitat: On coral reefs, on clean sand substratum, from 0 to 5 fathoms. Moderately common.

Distribution: Throughout the Fiji Islands. - From the Red Sea to Japan, East Australia and Samoa.

Discussion: *Murex ramosus* LINNAEUS is such a badly conceived species that it is questionable whether it can be retained in muricid nomenclature either as a species or a type species. From the 16 figures cited by LINNAEUS (1758) for *M. ramosus*, only 2 or possibly 3 figures depict *M. ramosus* auctt.; the citations cover 7 different species. GMELIN (1791) and DILLWYN (1817) adopted the same confused synonymy. RÖDING (1798) cited MARTINI (1777), figures 981 and 982 for *Purpura ramosa* var. α ; the figures cited represent *Murex ramosus* auctt. and *M. brevifrons* LAMARCK, 1822 respectively. *Purpura ramosa* LINK, 1807 is identical with RÖDING's species. The *M. ramosus* of MONTFORT, 1810, generally cited as the type of *Chicoreus* MONTFORT, 1810 is *M. brevifrons* LAMARCK. *Murex inflatus* LAMARCK, 1822 is *M. ramosus* auctt. and is an objective synonym of *P. incarnata* RÖDING, 1798 and a primary homonym of *M. inflatus* BROCCHE, 1814.

Murex ramosus of authors will have to remain a species without a holotype since the Linnean collection contains 2 syntypes of *M. ramosus* LINNAEUS, one of which is the species *M. pomum* GMELIN, 1791 and the other *M. brunneus* (LINK, 1807); both specimens appear to be genuine syntypes as both were marked in Linnaeus' handwriting for *M. ramosus* (fide DODGE, 1957). Neither of the two syntypes would qualify for a lectotype selection of *M. ramosus* auctt., and a re-introduction of *Purpura incarnata* RÖDING, 1798 for the large Indo-Pacific *Chicoreus* species may prove to be the most acceptable course in the circumstances.

On the basis of cited figures, *Murex monodon* SOWERBY, 1825 is *M. ramosus* LINNAEUS in part only. SOWERBY (1825) refers to "Martini [1777], Conch. Cab., 3, t. 105, figs. 987, 980" for *M. monodon*; figure 987 is *M. monodon*, figure 980 is *M. ramosus*. However, figure 980 does not occur on plate 105 but on plate 102, and it is therefore probable that figure 980 is a transcription error for figure 988 on plate 105, which is indeed *M. monodon*. *Purpura cornucervi* RÖDING, 1798, was based on the same figures 987 and 988, and has priority.

Chicoreus saulii (SOWERBY, 1841)

(Plate 15, Figure 12)

1841. *Murex saulii* SOWERBY, Conch. Illust., *Murex*, fig. 77
 1841. *Murex saulii* SOWERBY, Proc. Zool. Soc. London for 1840, pt. 8: 141
 1853. *Murex (Chicoreus) sauliae* (sic) SOWERBY, H. & A. ADAMS, Gen. Rec. shells, 1: 73
 1896. *Murex saulae* (sic) SOWERBY, CROUCH, Proc. Malac. Soc. London, 2 (3): 135
 1959. *Murex (Chicoreus) sawlii* (sic) SOWERBY, KIRA, Col. illust. shells Japan, 1: 189, pl. 69, fig. 1

Shell: Shell moderately light in weight, orange-brown in colour, ornamented with dark brown spiral cords. Teleoconch consists of 7 to 8 whorls, protoconch with 1½ brown and smooth nuclear whorls. Sculptured with spiral cords and fine, gemmate intermediate spiral lirae, 1 to 2 nodes between varices which number 3 per whorl. Varical fronds moderately produced, foliated and open, numbering from 4 to 6 on the labial varix and 2 to 3 on the siphonal canal. Aperture moderately large, white in colour, occasionally with a light rosy tinge; labial lip with 13 to 18 denticles, columella smooth, but occasionally with a single denticle near the siphonal canal; anal notch prominent. Siphonal canal moderately slender and produced, slit on ventral side open.

Size: 64 mm to 75 mm.

Type locality: Insulam Capul, Philippinarum.

Habitat: Dredged in 8 fathoms on coral-rubble substratum. Rare.

Distribution: South Viti Levu. – From the Philippine Islands to Japan, East Australia and the Fiji Islands.

Discussion: As is evident from the synonymy, this specific name is frequently misspelled, due no doubt to SOWERBY's unusual latinization of a patronymic name. Miss Jane Saul had 8 species named in her honour which were spelled either "*saulae*" or "*sauliae*." SOWERBY named 2 of these, one which he spelled *Murex saulii* while he spelled the other *Marginella sauliae* SOWERBY, 1846, although both species originated from the same collection.

Pterynotus SWAINSON, 1833

Pterynotus SWAINSON, 1833, Zool. Illust., ser. 2, pl. 100 – Type species by SD (SWAINSON, 1833) *Murex pinnatus* SWAINSON, 1822 = *Pterynotus alatus* (RÖDING, 1798)

Characters: Shell light in weight, slender, spire high, whorls convex. Sculptured with numerous fine spiral cords, axial riblets in interstices, thin, compressed and incised varices, 3 varices per whorl and nodes between varices; varical spines or fronds absent in the type species, but may appear as curved hook-like appendages in other members of the genus. Aperture small, elongate-ovate, labial

lip denticulate, columella generally smooth, anal notch weak. Siphonal canal slender, produced and recurved, slit on ventral side open.

Operculum with a basal nucleus. The rhachidians of the radula are equipped with 3 large, almost equal-sized main cusps, while intermediate denticles are absent (*vide* HABB in VOKES, 1964).

Discussion: The type species *Murex pinnatus* SWAINSON was no stranger to 18th century iconographers. MARTINI (1777) describes in detail his "geflügelte dreieckige Purpurschnecke" and figures the species on plate 111, figures 1036 and 1037. These figures are unquestionably *Murex pinnatus* and were cited by RÖDING (1798) for *Purpura alata* ("The white winged Purpura snail" [trans.]). The synonymy of *M. pinnatus* SWAINSON appears to be as follows:

1791. *Murex ramosus* var. *e* (pars) GMELIN, Syst. Nat., ed. 13, p. 3528, no. 13 (non LINNAEUS, 1758)
 1798. *Purpura alata* RÖDING, Mus. Bolten., p. 144, no. 1085 (ref. MARTINI, 1777, 3, t. 111, figs. 1036, 1037)
 1822. *Murex pinnatus* SWAINSON, Cat. coll. Bligh, App. p. 17 (non *Triplex pinnata* PERRY, 1811 = *Pterynotus* sp.)
 1840. *Murex martinianus* PFEIFFER, Krit. Reg. Mart. & Chemn., p. vii (ref. MARTINI, *op. cit.*, figs. 1036, 1037) [non REEVE, 1845]

PFEIFFER (1840) in his critical analysis of MARTINI & CHEMNITZ's "Conchylien-Cabinet" remarks that he could elucidate the species illustrated in the first four volumes through the study of Martini's original specimens; the labels were marked in Martini's own handwriting and were in the Museum of Pfeiffer's brother-in-law, Mr. Hermann Nathusius of Hundisburg. Pfeiffer considered the species figured by MARTINI (*op. cit.*) in figures 1036 and 1037 as undescribed, overlooking RÖDING's prior description. DESHAYES & MILNE-EDWARDS (1843) as well as DUNKER (1882) refer the MARTINI figures 1036 and 1037 to the synonymy of *Murex pinnatus* SWAINSON.

Not only is *Pterynotus alatus* (RÖDING) an earlier name for *Murex pinnatus*, but SWAINSON's species name may well be a secondary homonym of *Triplex pinnata* PERRY, 1811 (plate 7, figure 5). PERRY's figure represents a white *Pterynotus* species which has been synonymized, possibly incorrectly, with *M. tripterus* BORN, 1778 by DESHAYES & MILNE-EDWARDS (1843, p. 578). *Murex phyllopterus* LAMARCK, 1822, described from an unknown locality and without figure citations, is almost certainly *M. pinnatus*; the description fits the species perfectly.

Murex alatus GMELIN, 1791 (based on CHEMNITZ, 1780, 4, t. 159, figs. 1503, 1504) does not pre-occupy *Purpura alata* RÖDING, 1798, as GMELIN's species is a clavinine turrid better known as *Pleurotoma crenulata* LAMARCK, 1822.

No type locality has been cited by RÖDING (1798) for his *Purpura alata*; however, MARTINI (1777, p. 349) reports the species from the coast of Coromandel, Tranquebar [= Tranquebar, southeast coast of India].

Pterynotus elongatus (LIGHTFOOT, 1786)

(Plate 15, Figure 13)

1786. *Murex elongatus* LIGHTFOOT, Cat. Port. Mus., p. 65, no. 1479 (ref. FAVANNE, 1780, pl. 79, fig. H)
 1791. *Murex ramosus* var. ϵ (pars) GMELIN, Syst. Nat., ed. 13, p. 3528, no. 13 (non LINNAEUS, 1758)
 1798. *Purpura draco* RÖDING, Mus. Bolten., p. 144, no. 1809 (ref. MARTINI, 1777, 3, fig. 1033)
 1822. *Murex uncinarius* LAMARCK, Hist. nat. anim. sans vert., 7: 166 (ref. MARTINI, *op. cit.*, t. 111, figs. 1034?, 1035?)
 1842. *Murex clavus* KIENER, Spéc. Gen. Icon. Coq. Viv., *Murex*, pp. 111-112, pl. 37, figs. 2, 2 (ref. MARTINI, *op. cit.*, t. 111, figs. 1033, 1034, 1035) [non MICHELOTTI, 1841]
 1967. *Murex elongatus* SOLANDER, CROSS, Hawai. Shell News, 15 (1): 1, 2 figs. (animal)

Shell: Shell light in weight, white or creamy-white in colour throughout; spire very long and slender, whorls convex. Teleoconch consisting of 7 whorls, protoconch calcified in adult specimens. Sculptured with spiral striae which are close-set and prominent on varices, granulose spiral cords at base and 3 wing-like, thin and compressed varices at every whorl; earlier whorls axially ribbed between varices. Fronds or spines generally absent, but some specimens do have a few curved, open and hook-like varical appendages. Aperture small, elongate-ovate, white or creamy-white, sometimes with a pinkish tinge; labial lip with 15 to 20 denticles, columella elevated and with 2 to 4 denticles situated near the siphonal canal, anal notch obsolete. Siphonal canal moderately broad and short, slit on ventral side open.

Size: 55 mm to 70 mm.

Type locality: None. "Ostindien, Batavia" was mentioned as locality by MARTINI (1777) and "Batavia, Indonesia" is here selected as type locality.

Habitat: On coral and clean sand substratum, from 3 to 5 fathoms. Rare.

Distribution: Throughout the Fiji Islands. — From the Red Sea to Japan, North Australia and the Hawaiian Islands.

Discussion: MARTINI's figure 1033 was based on a specimen from the Bolten collection (*vide* MARTINI, 1777, p. 349); the same specimen was later named *Purpura draco* RÖDING, 1798, and the same figure 1033 has been referred to by KIENER (1843) for his *Murex clavus*. MARTINI (*op. cit.*) figured another specimen of *M. elongatus* on the same plate in figures 1034 and 1035. The figured specimen, which appears to be beach-worn (labial lip is missing)

has been described in detail by MARTINI; the author mentioned the three-sided appearance of the shell and the 3 compressed varices as well as the shell's fragile texture. He went on to point out that the actual shell was larger than depicted in the figure (ca. 56.0 mm). These 2 figures, however, were cited with a query for *M. uncinarius* LAMARCK, 1822, for which a size of 11 lignes (ca. 25.0 millimeters) was given. On the basis of LAMARCK's figure citations, *M. uncinarius* is unquestionably conspecific with *M. elongatus* LIGHTFOOT; his description also agrees with the latter species, with the exception of the phrase "albido-fulva" and the small size of LAMARCK's specimen. *Murex uncinarius* KIENER, 1842 and of authors is a small muricid species from South Africa, and is the type species of *Poropteron* JOUSSEAUME, 1880. This is once again a case where cited figures are in conflict with the subsequent interpretation of the species and possibly the holotype. The only possibility of evaluating *M. uncinarius* LAMARCK is to figure and re-describe the holotype, and expunge the cited MARTINI figures from the synonymy, provided that LAMARCK's species is indeed conspecific with KIENER's *M. uncinarius*. Another alternative would be to accept the subsequent junior synonym *M. capensis* SOWERBY, 1841 (Conch. Illust., fig. 76). SOWERBY's *M. mitraeformis* (1841, fig. 75) has figure priority, but is a homonym of *M. mitraeformis* BROCCCHI, 1814.

Murex clavus MICHELOTTI, 1841 need not be replaced on account of the earlier *M. clava* GMELIN, 1791. The Latin words *clāva* and *clāvus* are nouns of feminine and masculine gender respectively, and the rule of adjectival species-group names does not apply in this case.

KIENER's plates to *Murex* were issued in 1842 (*vide* SHERBORN & WOODWARD, 1901, p. 217) and the text in 1843. The plates contain the specific names at the lower margin and KIENER's *Murex* species have been established as from the date of issue of the plates.

(*Naquetia*) JOUSSEAUME, 1880

Naquetia JOUSSEAUME, 1880, Le Naturaliste, 2 (42): 335 — Type species by OD *Murex triquetter* BORN, 1778

Characters: Shell solid, moderately slender, spire elevated, whorls convex. Sculptured with coarse spiral cords, axial ribs and 3 varices per whorl; varices are not wing-like and compressed as in *Pterynotus*, and flat flanges are evident on the labial varix. Aperture oviform, labial lip denticulate, columella smooth or denticulate, anal notch shallow or obsolete. Siphonal canal broad and moderately short.

Operculum with a basal nucleus. The rhachidians of the radula are broad and short, with only 3 cusps of

which the central cusp is twice as long as the side-cusps; intermediate cusps are degenerate, indicated only as vertically incised wrinkles in some specimens, or are absent altogether in other specimens.

Discussion: In shell and radula characters, this group is intermediate between *Chicoreus* MONTFORT and *Pterynotus* SWAINSON. The radula, although similar in characters to *Pterynotus* (vide HABE in VOKES, 1964), differs sufficiently to separate the group at least subgenerically. The 3 main cusps in *Pterynotus* are large and almost of equal size, and rather similar in pattern to the radula of *Typhis tosaensis* AZUMA, 1960 (p. 99, text fig. 2). In *Naquetia*, however, the main central cusp is twice as long as the flanking main cusps, and remnants of the small intermediate denticles may occasionally be seen in some specimens.

Pterynotus (Naquetia) tripterus (BORN, 1778)
(Plate 15, Figure 14)

1778. *Murex tripterus* BORN, Ind. rer. nat. Mus. Caes. Vindob., p. 287
1780. *Murex tripterus* BORN, Test. Mus. Cae. Vindob., p. 291, t. 10, figs. 18, 19
1834. ? *Murex trialatus* var. SOWERBY, Conch. Illust., *Murex*, fig. 54 only

Shell: Shell solid and heavy, dirty-white or light fawn in colour throughout. Teleoconch consists of 5 to 6 whorls, protoconch with 2 calcified nuclear whorls. Sculptured with spiral ridges, 3 varices per whorl and a single node between varices; labial varix large and compressed. Aperture elongate-oviform, flesh or cream in colour, labial lip with 6 to 8 white denticles and small accessory denticles; columella with 7 to 10 white denticles, anal notch obsolete. Siphonal canal broad and short, slit on ventral side open. Operculum orange-brown and with a sub-basal nucleus.

Size: 30 mm to 60 mm.

Type locality: Coasts of Batavia.

Habitat: Under coral rocks, on muddy sand substratum, in shallow water. Rare.

Distribution: West Viti Levu. — From Indonesia to Japan and the Fiji Islands.

Discussion: DESHAYES & MILNE-EDWARDS (1843, p. 578)

place *Triplex pinnata* PERRY, 1811 in the synonymy of *Murex tripterus* BORN. PERRY's figure does not quite resemble *M. tripterus*, unless it be a very worn specimen.

Pterynotus (Naquetia) triquetter (BORN, 1778)
(Plate 15, Figure 15; Text figure 6)

1778. *Murex triquetter* BORN, Ind. rer. nat. Mus. Caes. Vindob. p. 288
1780. *Murex triquetter* BORN, Test. Mus. Caes. Vindob., p. 291, t. 11, figs. 1, 2
1791. *Murex ramosus* var. ζ (pars) GMELIN, Syst. Nat., ed. 13, p. 3528, no. 13 (non LINNAEUS, 1758)
1798. *Purpura variegata* RÖDING, Mus. Bolten., p. 143, no. 1799 (ref. MARTINI, 1777, 3, t. 111, fig. 1038)
1798. *Purpura cancellata* RÖDING, Mus. Bolten., p. 143, no. 1801 (ref. MARTINI, op. cit., t. 111, fig. 1038)
1811. *Triplex flexuosa* PERRY, Conchology, pl. 7, fig. 1
1816. *Murex trigonulus* LAMARCK, Tabl. Encycl. Méth., p. 5, pl. 417, figs. 4 a, 4 b
1907. *Murex (Chicoreus) triquetter* var. *amanuensis* COUTURIER, Journ. Conchyl., 55: 142

Shell: Shell moderately light in weight but solid, spire elevated; uniformly creamy-white or light brown, maculated with dark brown on varices and labial lip. Teleoconch consists of 5 to 6 whorls, protoconch with 2 smooth brown nuclear whorls. Sculptured with spiral cords and intermediate spiral ridges, 3 varices per whorl and 2 to 3 axial ribs between varices; varices foliated and somewhat compressed anteriorly. Aperture moderately small, oviform and white, labial lip with 12 to 16 denticles; columella smooth, occasionally with a denticle near the siphonal canal, anal notch obsolete. Siphonal canal broad and short, or moderately slender and slightly produced, slit on ventral side open. Operculum with a basal nucleus.

Radula: The radula is of the *Pterynotus* type, with 3 main cusps only, but occasionally with extremely weak vestiges of intermediate denticles which do not protrude past the top of the plate. Length of radular ribbon 6.3 mm, width 0.31 mm in an animal with a shell 58 mm in length; the ribbon is white and numbers 102 rows of teeth (+ 6 nascentes) (see Text figure 6).

Size: 40 mm to 70 mm.

Type locality: None. ("Tranquebar, Ostindien," MARTINI, 1777).

Explanation of Plate 15

Figure 12: *Chicoreus saulii* (SOWERBY). x 0.7

Figure 13: *Pterynotus clongatus* (LIGHTFOOT). x 0.9

Figure 14: *Pterynotus tripterus* (BORN). x 0.9

Figure 15: *Pterynotus triquetter* (BORN). x 0.9

Figure 20: *Favartia tetragona* (BRODERIP). x 1.5

Figure 16: *Homalocantha anatomica* (PERRY). x 0.9

Figure 17: *Poiricria nodulifera* (SOWERBY). x 0.9

Figure 18: *Vitularia miliaris* (GMELIN). x 1.9 & 0.8

Figure 19: *Favartia brevicula* (SOWERBY). 2.0

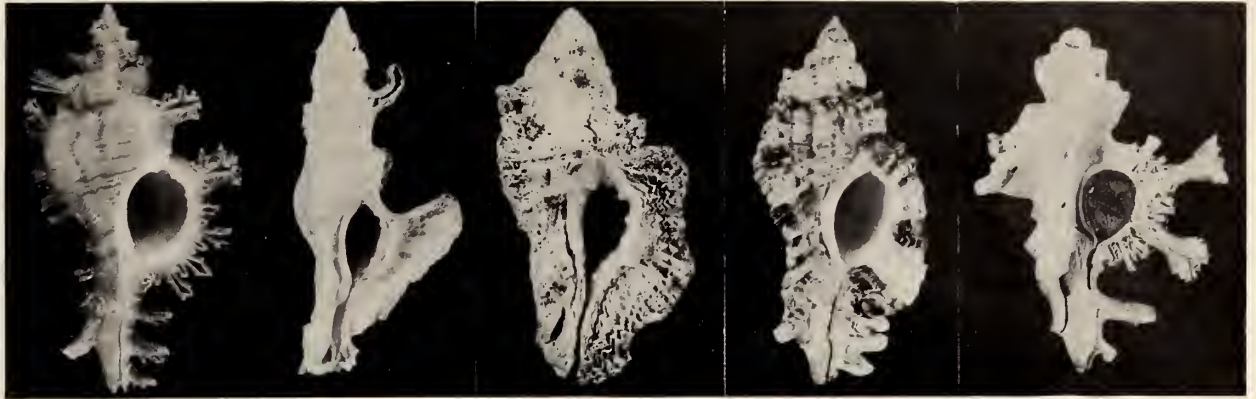


Figure 12

Figure 13

Figure 14

Figure 15

Figure 16

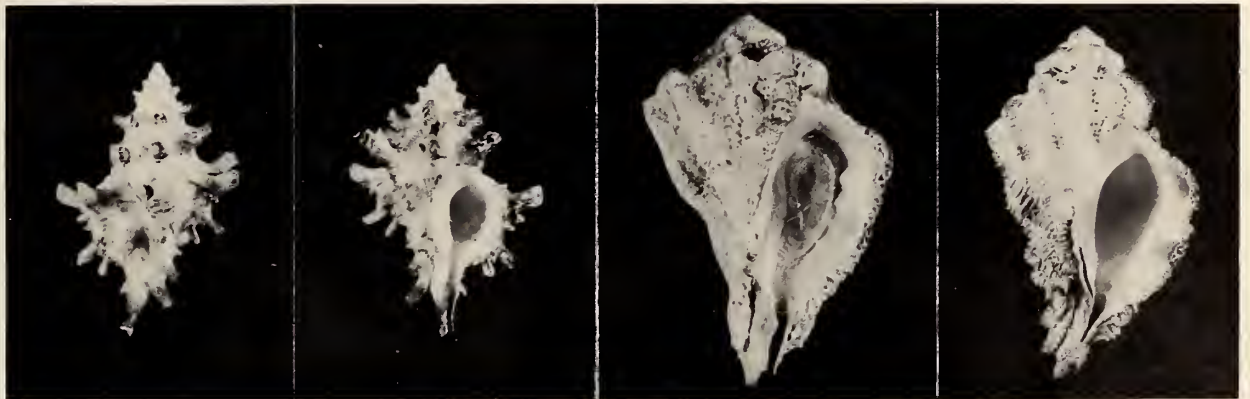


Figure 17

Figure 18

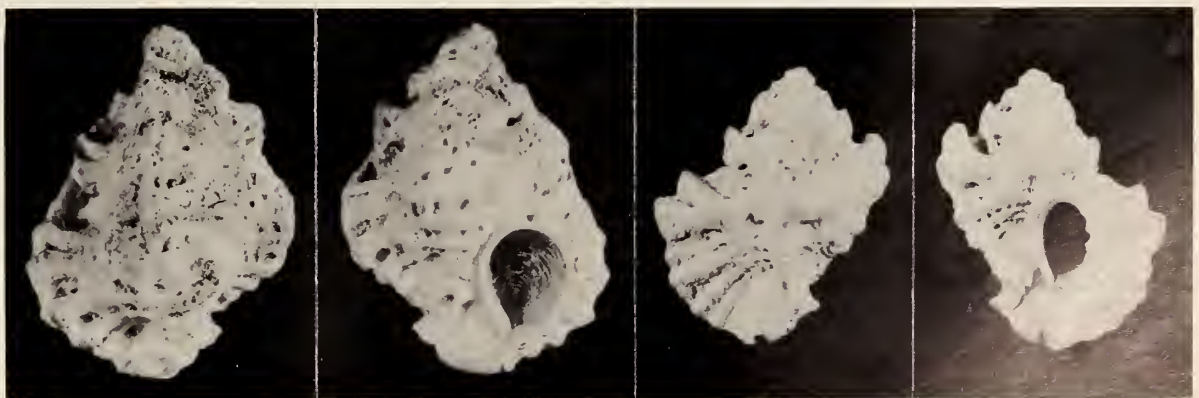
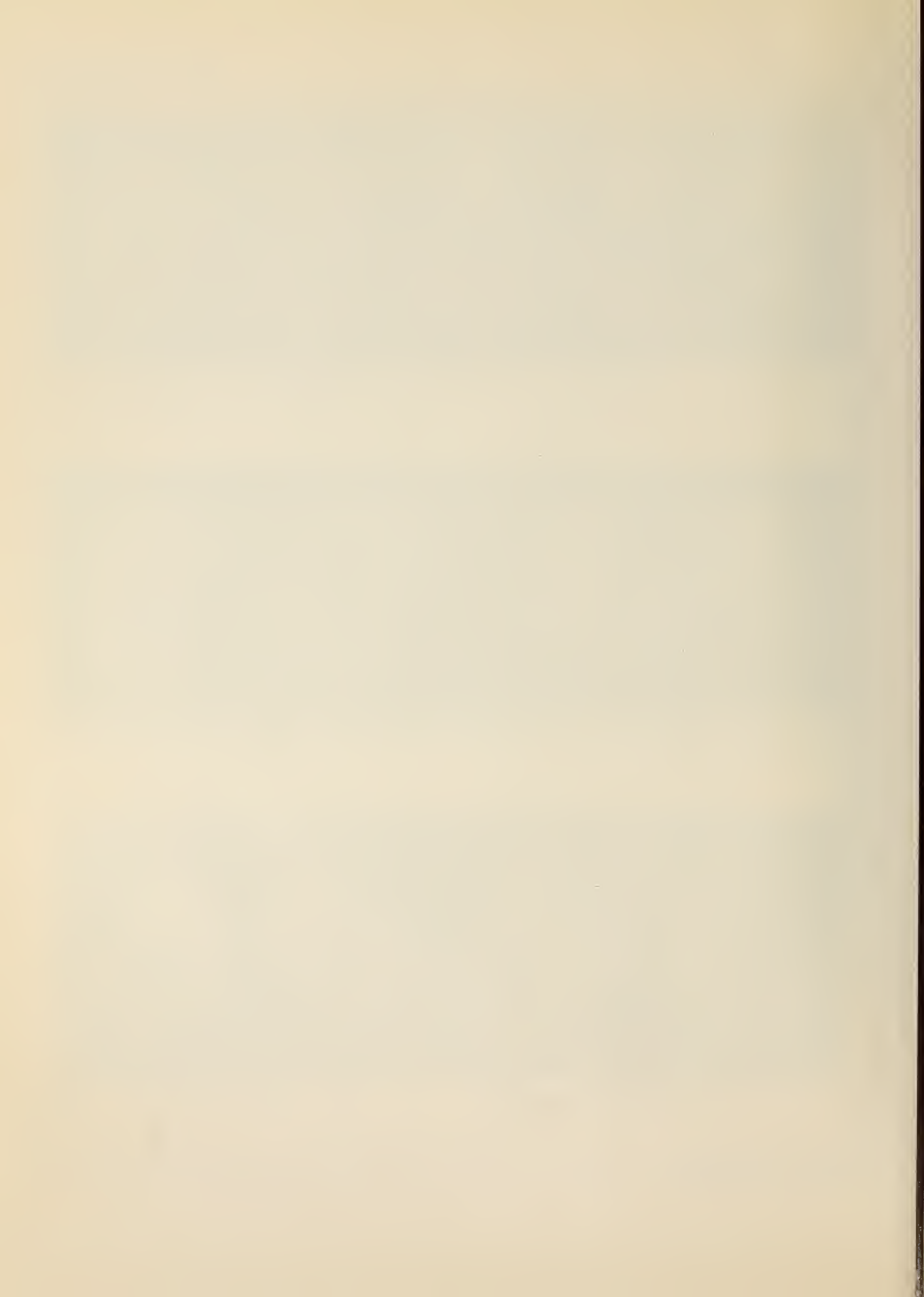


Figure 19

Figure 20



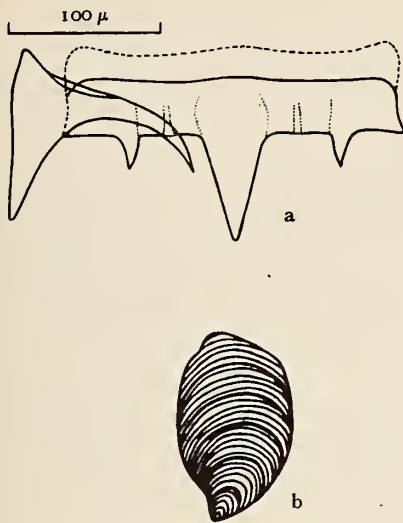


Figure 6
Pterynotus triqueter (BORN)

a. Half-Row of Radular Teeth
Fiji Islands

b. Operculum

Habitat: Under coral rocks, on clean and muddy sand substratum, in shallow water. Uncommon.

Distribution: Throughout the Fiji Islands. — From East Africa to Japan, East Australia and the Tuamotu Archipelago.

Discussion: The type figures of *Murex trigonulus* LAMARCK, 1816, clearly depict *M. triqueter* BORN; six years later LAMARCK himself placed the species in the synonymy of *M. triqueter* BORN.

Murex triqueter amanuensis COUTURIER appears to be a smaller, more slender and elongated variant which occurs sporadically in Fiji and the Philippine Islands, and is of no racial significance.

Poirieria JOUSSEAUME, 1880
(Text figure 7)

Poirieria JOUSSEAUME, 1880, *Le Naturaliste*, 2 (42): 335 — Type species by OD *Murex zelandicus* QUOY & GAIMARD, 1833

Characters: Shell light in weight, spire elevated, whorls angulate, varical spines moderately long and open, but becoming progressively shorter towards early whorls. Sculptured with weak spiral ridges and 5 to 6 varices per whorl. Aperture wide and oval, labial lip with foliated depressions, columella smooth and calloused, anal notch obsolete. Siphonal canal moderately long, open and recurved. Operculum with a basal nucleus.

Discussion: The radula of the type species *Poirieria zelandica* is figured here (Text figure 7). The radula was extracted from a specimen collected off Mayor Island, Bay of Plenty, New Zealand in 1926, and the slide was made available by Dr. A. W. B. Powell. The radular ribbon measured 6.7 mm in length and 0.24 mm in width, length of shell unknown; the radular ribbon contained 182 rows of teeth, and no nascentes were visible.

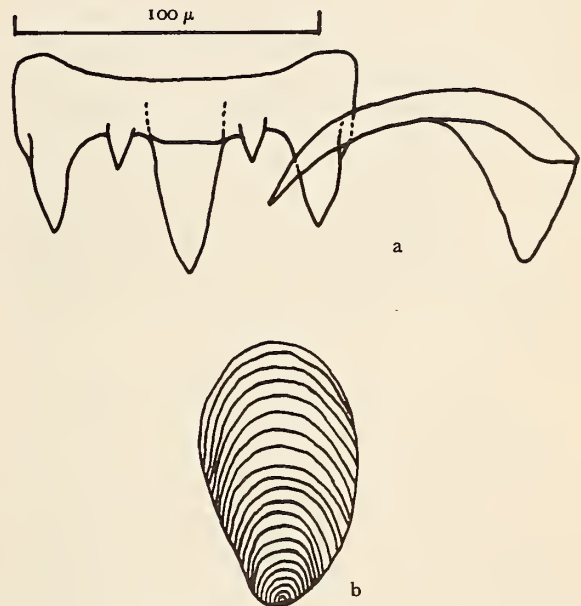


Figure 7

Poirieria zelandica (QUOY & GAIMARD)

a. Half-Row of Radular Teeth

b. Operculum

New Zealand

Poirieria nodulifera (SOWERBY, 1841)
(Plate 15, Figure 17)

1841. *Murex noduliferus* SOWERBY, *Conch. Illust., Murex*, fig. 101

1841. *Murex noduliferus* SOWERBY, *Proc. Zool. Soc. London for 1840*, pt. 8: 147

Shell: Shell small and light in weight, spire elevated; creamy-white to yellowish in colour, irregularly lined with brown, varical spines and siphonal canal stained brown. Sculptured with spiral ridges, 6 to 7 varices on body whorl and 7 to 9 varices on earlier whorls; varical spines prominent and open, numbering from 4 to 6 on the labial varix and from 0 to 1 on the siphonal canal. Aperture oviform, white or creamy-yellow, labial lip with 5 to 7 denticles; columella smooth and calloused, occasionally

with 0 to 4 denticles near the siphonal canal, anal notch obsolete. Siphonal canal slender, moderately long, open and recurved.

Size: 20 mm to 32 mm.

Type locality: Insulam Masbate [Philippine Islands].

Habitat: On sand and coral-rubble substratum in 8 fathoms. Moderately rare.

Distribution: North and South Viti Levu. - From the Philippine Islands to Japan, New Guinea and the Fiji Islands.

Discussion: SHIKAMA (1963) assigned the species to the subfamily Drupinae, genus *Drupa* RÖDING, 1798, subgenus *Morula* SCHUMACHER, 1817, but I believe that a placing of this species in *Poirieria* is more appropriate. This species has an elevated spire, not unlike the type species of *Murexsul* IREDALE, 1915, and the denticulate labial lip is a character evident in *Muricopsis* BUQUOY, DAUTZENBERG & DOLLFUS, 1882. The number of varices, produced and open varical spines and features of siphonal canal are characters associating the species with *Poirieria* JOUSSEAUME.

Favartia JOUSSEAUME, 1880

Favartia JOUSSEAUME, 1880, Le Naturaliste, 2 (42): 335 - Type species by OD *Murex breviculus* SOWERBY, 1834

Characters: Shell small and solid, teleoconch with about 5 whorls, protoconch with $1\frac{1}{2}$ bulbous nuclear whorls. Sculptured with strong spiral cords and descending axial ridges which appear on varices as deep pits; varices strong and rounded, numbering 4 per whorl. Aperture roundly ovate, elevated, labial lip scalloped, columella smooth, anal notch absent. Siphonal canal short, recurved and either slightly open or completely closed in adult specimens.

Operculum is muricine, orange-brown in colour and with a basal nucleus. The radula type is muricine (?) (*vide* THIELE, 1929).

Discussion: VOKES (1964) placed *Favartia* in the genus *Aspella* and remarked that the group was intermediate between Muricinae and Tritonaliinae on account of the operculum which is muricine and a radula which is closer to Tritonaliinae. The operculum is undoubtedly muricine, and the radula of *Aspella* was described as muricine by THIELE (*op. cit.*), *i. e.* "rhachidian of radula with triangular central cusp and two smaller denticles between the three main cusps" [transl.]. *Favartia*, however, may not be related to *Aspella* at all, especially if the radulae of the two genera could be compared. *Favartia*, and especially the species *F. tetragona* (BRODERIP), bears a resemblance to *Nothotyphis* FLEMING, 1962, in features of shell appearance, size, latticed sculpture, guttered spines and completely closed canal.

Favartia brevicula (SOWERBY, 1834)

(Plate 15, Figure 19; Text figure 8)

1834. *Murex breviculus* SOWERBY, Conch. Illust., *Murex*, fig. 37

1841. *Murex breviculus* SOWERBY, Proc. Zool. Soc. London for 1840, pt. 8: 146

Shell: Shell small and solid, dirty-white in colour, whorls convex. Teleoconch consisting of 5 whorls, protoconch with $1\frac{1}{2}$ bulbous calcified nuclear whorls. Sculptured with 5 to 6 strong spiral cords which are intersected by descending axial ridges which are especially prominent on varices; varices generally blunt and rounded, numbering 4 per whorl, and ornamented with 1 to 2 short spines. Aperture roundly-ovate, elevated, white, deep interior purplish; labial lip with 6 to 11 scalloped denticles, columella white, calloused and smooth, anal notch absent. Siphonal canal short and slender, slightly open or com-



Figure 8

Operculum of *Favartia brevicula* (SOWERBY)

pletely closed in adult specimens, and recurved almost at 90° towards the dorsum. Operculum orange-brown and with a basal nucleus (Text figure 8).

Size: 15 mm to 30 mm.

Type locality: None.

Habitat: Under coral rocks, on muddy sand and coral substratum in shallow water. Moderately common.

Distribution: Throughout the Fiji Islands. - From the Philippine Islands to Japan, East Australia and Tonga Islands.

Discussion: The siphonal canal is more slender and sharply recurved in *Favartia brevicula* than in *F. tetragona*. The siphonal canal is either slightly open or completely closed in adult specimens.

Favartia tetragona (BRODERIP, 1833)

(Plate 15, Figure 20)

1833. *Murex tetragonus* BRODERIP, Proc. Zool. Soc. London for 1832, pt. 1: 174

1834. *Murex tetragonus* BRODERIP, SOWERBY, Conch. Illust., *Murex*, fig. 25

Shell: Shell small and solid, white in colour throughout. Teleoconch consisting of 4 whorls, protoconch of $1\frac{1}{2}$ nuclear whorls. Sculptured with 8 to 10 spiral cords, obsolete and irregular axial riblets and pittings in interstices of cords; varices number 4 per whorl, and are large and compressed and bear remnants of somewhat curved guttered spines. Aperture small and oviform, white, interior lavender with dark brown bands. Labial varix broad and flaring, labial lip ornamented with 7 to 8 raised and scalloped denticles, columella smooth, anal notch absent. Siphonal canal broad, short, completely closed and only slightly recurved for a short distance. Operculum with a basal nucleus; the animal is yellowish-brown in colour.

Size: 20 mm to 36 mm.

Type locality: None.

Habitat: Under coral rocks on clean sand and coral rubble substratum, from 0 to 5 fathoms. Rare.

Distribution: Mamanuca group. West off Viti Levu. – ?

Discussion: This species differs from *Favartia brevicula* in features of form, sculpture, aperture and anterior canal; the latter is broad and short and lacks the tube-like, turned over extension of the canal of *F. brevicula*.

Phyllocoma TAPPARONE-CANEFRI 1881

Phyllocoma TAPPARONE-CANEFRI, 1881, Ann. Soc. Malac. Belg. Mém., 15: 44 – Type species by SD (WENZ, 1941) *Triton convolutus* BRODERIP, 1833

Characters: Shell small, ranellid in appearance, spire higher than aperture, whorls subulate and convex, early whorls fenestrate. Sculptured with strong spiral cords, axial ridges and 2 plain but prominent varices at every whorl. Labial lip calloused, glazed and smooth, anal notch shallow; siphonal canal short, open and recurved.

Discussion: The genus is assigned to the Muricinae only tentatively. THIELE (1929) describes and figures the radula of *Phyllocoma* as having a rhachidian with almost equal-sized 3 main cusps; the operculum is said to have a basal nucleus. A tricuspid rhachidian of the radula may be found in Muricinae, Typhinae and Rapaninae, and an operculum with a basal nucleus is present in the first 2 subfamilies; in shell morphology the genus appears to stand alone. Shell morphology, however, is in certain cases of little assistance in a supraspecific division of a group. In the past, toxoglossate turrids were classed with stenoglossate mitrids on account of the similarity in shell morphology. It would be reasonable to assume that a particular radula type is peculiar to a group of species due to their evolutionary process through time from a common ancestral stock, and not only because of divergence in food requirement. It is possible, however, that the radula type of *Phyllocoma* described by THIELE (*op. cit.*) may

really belong to *Galfridus* IREDALE, 1924 and may after all be appreciably different from *Phyllocoma* s. str. Until more information is known about the anatomy of the type species, the subfamilial position of *Phyllocoma* is *incertae sedis*.

Phyllocoma convolutum (BRODERIP, 1833)

(Plate 14, Figure 4)

1833. *Triton convolutus* BRODERIP, Proc. Zool. Soc. London for 1832, pt. 1: 7

Shell: Shell small and solid, ivory-white or fawn in colour, spire high, whorls subulate and convex. Teleoconch consists of about 8 whorls apart from protoconch which was missing in specimens examined. Sculptured with prominent raised spiral ridges which number from 18 to 20 on the body whorl and 8 to 10 on the penultimate whorl; spiral ridges closely axially striate, terminating as close-set spiral grooves at the base. The first 5 whorls are fenestrate in appearance, with axial and spiral ridges intersecting. Aperture large and oval, ivory-white in colour, labial lip slightly elevated and ornamented with 20 to 23 denticles which extend towards the interior of the aperture; columella heavily calloused, smooth and porcellaneous, anal notch moderately distinct, interior of aperture light brown. Siphonal canal short and open, moderately recurved towards the dorsum.

Size: 20 mm to 26 mm.

Type locality: None.

Habitat: On sand and coral rubble substratum in 15 fathoms. Rare.

Distribution: South Viti Levu and Mamanuca group, West off Viti Levu. – From the Philippine Islands to Japan, North Australia and the Fiji Islands.

Tritonaliinae

Homalocantha MÖRCH, 1852

Homalocantha MÖRCH, 1852, Cat. Conch. Yoldi, 1: 95 – Type species by M *Murex scorpio* LINNAEUS, 1758

Characters: Shell moderately small, solid, spire low, whorls angulate and convex. Teleoconch consisting of 4 to 5 whorls, protoconch of 1 to $1\frac{1}{2}$ nuclear whorls. Sculptured with strong and distant spiral cords, fine intermediate spiral striae, 5 to 6 varices on body whorl and 5 to 7 varices on penultimate whorl. Varical fronds moderately long, T-shaped and open at distal end, numbering *ca.* 2 to 6 on the labial varix and 1 to 3 on the siphonal canal. The webbing between labial digitations is prominent in the type species but can be absent in other members of the genus. Aperture small, roundly ovate, labial lip with

scalloped denticles, columella smooth, anal notch absent. Siphonal canal moderately broad and long, closed part of the way, but open and recurved at end.

Homalocantha anatomica (PERRY, 1811)
(Platc 15, Figure 16; Text figure 9)

1811. *Hexaplex anatomica* PERRY, Conchology, pl. 8, fig. 2

1823. *Murex rota* MAWE, Linn. Syst. Conch., p. 131, pl. 26, fig. 3

1921. *Murex pele* PILSBRY, Proc. Acad. Nat. Sci. Philadelphia for 1920: 318, pl. 12, figs. 29, 30

Shell: Shell moderately light in weight, solid, generally dirty-white in colour throughout. Whorls angulate, numbering 4 apart from protoconch which is calcified in adult specimens. Sculptured with 2 prominent cords on the body whorl and fine small cords at the labial varix; varices number from 5 to 6 per whorl, varical digitations prominent, compressed and open. Aperture small, raised, white in colour, labial varix with 2 primary digitations; labial lip with irregular scalloped denticles, columella smooth,



Figure 9

Operculum of *Homalocantha anatomica* (PERRY)

anal notch absent. Siphonal canal moderately long, closed for part of the way but open for about $\frac{1}{3}$ of its total length towards the distal end.

Size: 34 mm to 56 mm.

Type locality: East Indies.

Habitat: Under coral rocks, on sand and coral substratum, in 0 to 2 fathoms. Moderately rare.

Distribution: Throughout the Fiji Islands. — From the Red Sea to Japan, Fiji and the Hawaiian Islands.

Discussion: D'ATTILIO (1964, 1964a) specifically differentiated *Homalocantha anatomica* and *H. pele* on the basis of main cord characters. He described and figured the Indian Ocean *H. anatomica* (from the Red Sea, Mozambique and Zanzibar), showing 3 main primary cords emanating from the body whorl and terminating in frondose digitations. The Hawaiian and Japanese *H. pele* were shown to possess only 2 main cords. All Fiji specimens collected to date are sculptured with only 2 main cords on the body whorl, while all other cords are secondary and degenerate. No comparison could be made with

Indian Ocean *H. anatomica*; however, should these differences in main cord characters really be stable, then a subspecific separation of the Indian Ocean *H. anatomica* (Red Sea to Philippine Islands) and the Pacific *H. anatomica pele* (Japan to New Guinea, Fiji and the Hawaiian Islands) would be warranted. For further discussion on the species see REHDER (1964).

Vitularia SWAINSON, 1840

Vitularia SWAINSON, 1840, Treat. Malac., p. 297 — Type species by M *Vitularia tuberculata* SWAINSON, 1840 = *Murex miliaris* GMELIN, 1791

Characters: Shell solid, moderate in size, whorls depressed, body whorl keeled; whorls number 4 to 5 apart from protoconch of 1 to $1\frac{1}{2}$ nuclear whorls. Sculptured with 7 to 9 oblique and nodulose varices, spiral ridges and occasionally scabrous granules. Aperture elongate-ovate, labial lip denticulate, columella sinuous, depressed and smooth, anal notch obsolete. Siphonal canal short and open, slightly recurved. Operculum with a dextro-lateral nucleus. **Discussion:** SWAINSON (1840) applied the spelling *Vitulina* on page 64 and *Vitularia* on page 297. GRAY (1847, p. 134) adopted *Vitularia* as the correct spelling from SWAINSON's multiple original spellings.

IREDALE (1929) established the genus *Transtrafer* for the new species *T. longmani* IREDALE, 1929, and in way of explanation mentioned the "striking resemblance" of his new species to the "American *Murex vitulinus* LAMARCK." This is obviously a case of mistaken identity, as *M. vitulinus* LAMARCK (= *M. miliaris* GMELIN) is an Indo-Pacific species, and conspecific with *T. longmani* IREDALE. Several writers have passed comments on the casual way in which IREDALE erected his new molluscan genera, and a detailed discussion on their nomenclatural validity can be found in SOLEM (1964). *Transtrafer* is just another of IREDALE's undefined generic groups, which would have qualified as a *nomen nudum* had it been described only 6 months later. Australian workers would certainly render malacological science a great service by re-describing IREDALE's several hundred generic groups and thousand odd species.

Vitularia miliaris (GMELIN, 1791)
(Platc 15, Figure 18; Text figure 10)

1791. *Murex miliaris* GMELIN, Syst. Nat., ed. 13, p. 3536, no. 39 (ref. MARTINI, 1777, 3: 303, vign. 36, figs. 1-5 & CHEMNITZ, 1788, 10, t. 161, figs. 1532-1535)

1798. *Purpura onagrina* RÖDING, Mus. Bolten., p. 139, no. 1751 to 1753 (ref. *sup. cit.*)

1816. *Murex vitulinus* LAMARCK, Tabl. Encycl. Méth., p. 5, pl. 419, figs. 1 a, 1 b, 7 a, 7 b